

What is claimed is:

1. A method of measuring the quality of service provided to a remote-access user of a virtual private network, said virtual private network comprising a plurality of private network locations interconnected through a public data network, with the remote-access user including a VPN client device directly connected to said public data network, the method comprising the steps of:

- a) providing measurement software at a VPN client location;
- b) collecting, at the VPN client location, VPN performance information;
- c) uploading the collected VPN performance information to a centralized server connected between the VPN and said public data network;
- d) filtering, normalizing and storing the uploaded VPN performance information at the centralized server;
- e) analyzing the stored VPN performance information; and
- f) generating a report measuring the quality of service as defined by the analysis of the stored service information.

2. The method as defined in claim 1 wherein the method further comprises the step of performing any required VPN service maintenance actions to correct communication problems included in the generated report.

3. The method as defined in claim 1 wherein step b) comprises the collection of: the date and time of each VPN connection attempt, the identity of the VPN server to which the VPN client is attempting to connect, any connection failure code, and disconnection reason code.

4. The method as defined in claim 1 wherein in step b) comprises the collection of information related to VPN accessibility, VPN sustainability and VPN availability.

5. The method as defined in claim 1 wherein the method is utilized for a plurality of separate remote-access VPN client devices, the steps of analyzing and generating then based on data collected from the plurality of separate remote-access VPN client devices.

6. The method as defined in claim 5 wherein at least one remote-access VPN client device comprises a persistent location VPN client device.
7. The method as defined in claim 5 wherein at least one remote-access VPN client device comprises a transient location VPN client device.
8. The method as defined in claim 5 wherein step f) includes the generation of an aggregate report based on the performance of the plurality of separate remote-access VPN client devices.
9. The method as defined in claim 1 wherein the collecting of step b) further comprises collecting information such as: link type, session duration, IP port identity, type of VPN protocol, type of VPN encryption, identity of network nodes traversed between the VPN client and VPN server.
10. A VPN client node for providing access to a VPN remotely located from a user, the VPN client node comprising
 - encryption/decryption elements for providing secure communication between the remotely located VPN client and a public data network, said public data network also coupled to said VPN; and
 - a quality measurement element associated with said VPN client node, said quality measurement element for collecting VPN client performance information and uploading the collected information to a server located in the data communication network.
11. A VPN client node as defined in claim 10 wherein the node is a persistent location, including at least one client user device and a VPN gateway coupling the at least one client node to the data network, wherein the quality measurement element is located at the VPN gateway.

12. A VPN client node as defined in claim 10 wherein the node is a transient, on-demand location with the quality measurement element co-located with the VPN client device.

13. A VPN client node as defined in claim 10 wherein the collected VPN client performance information includes the date and time of each VPN connection attempt by said VPN client node, the identity of the VPN server to which said VPN client node is attempting to connect, any connection failure code, and disconnection reason code.

14. A VPN client node as defined in claim 10 wherein said client node further comprises an upload feature for transmitting the VPN service information collected by the quality measurement element to a centralized server within the VPN.

15. A VPN client node as defined in claim 10 wherein the quality measurement element further collects VPN service information including link type, session duration, IP port identification, type of VPN protocol, type of VPN encryption, identity of network nodes traversed between the VPN client and VPN server.

16. A VPN centralized network server for generating information related to the quality of VPN service experienced by remote-access VPN users, the server comprising:
an arrangement for receiving connect/disconnect information collected by one or more remote-access VPN clients;

a storage means for filtering, normalizing and storing the received data;
an analysis element for reviewing the stored data to determine VPN performance;
and

a report generation element, coupled to the analysis element, for providing information regarding the quality of service at one or more remote-access VPN clients.

17. A VPN centralized network server as defined in claim 16 wherein the analysis element reviews performance information, for each remote-access VPN user, including VPN accessibility, VPN sustainability and VPN availability, where VPN

accessibility is defined as the ability to connect to a VPN, VPN sustainability is defined as the ability to maintain a connection, and VPN availability is defined as the ability of a persistent remote-access VPN location to maintain a persistent connection.

18. A VPN centralized network server as defined in claim 16 wherein the server is capable of receiving connect/disconnect information from a plurality of separately located remote-access VPN client devices.

19. A VPN centralized network server as defined in claim 18 wherein the server receives information from at least one persistent remote-access VPN client device.

20. A VPN centralized network server as defined in claim 18 wherein the server receives information from at least one transient remote-access VPN client device.

21. A VPN centralized network service as defined in claim 18 wherein the report generating element is capable of producing aggregate information associated with the plurality of separately located remote-access VPN client devices.